

We claim:

1. An isolated polynucleotide comprising a nucleotide sequence encoding a Lyp protein.
2. The polynucleotide of claim 1 wherein the polynucleotide is cDNA, DNA, genomic DNA, RNA or mRNA.
3. The polynucleotide of claim 1 wherein the nucleotide sequence encodes a human LyP protein.
4. The polynucleotide of claim 3 wherein the nucleotide sequence is selected from the group consisting of
  - (a) a nucleotide sequence encoding the amino acid sequence of Table 2 (Sequence ID NO:2), or a splice variant thereof; and
  - (b) a nucleotide sequence encoding the amino acid sequence of Table 4 (Sequence ID NO:4).
5. The polynucleotide sequence of claim 4 wherein the nucleotide sequence is selected from the group consisting of
  - (a) the nucleotide sequence of Table 1 (Sequence ID NO:1);
  - (b) the nucleotide sequence of Table 3 (Sequence ID NO:3);
  - (c) a nucleotide sequence complementary to the nucleotide sequence of (a) or (b);
  - (d) a nucleotide sequence which is a degeneracy equivalent of the nucleotide sequence of (a) or (b); and
  - (e) a nucleotide sequence which hybridises under stringent conditions to a nucleotide sequence of (a) or (b).

6. An isolated polynucleotide which encodes a Lyp protein having an amino acid sequence of greater than 70% overall identity to the amino acid sequence of Table 2.
7. An isolated polynucleotide which encodes a Lyp protein having an amino acid sequence of greater than 70% overall identity to the amino acid sequence of Table 4.
8. An isolated polynucleotide which encodes a Lyp protein having an amino acid sequence with at least 80% overall identity, preferably at least 90% overall identity to the amino acid sequence of Table 2.
9. An isolated polynucleotide which encodes a Lyp protein having an amino acid sequence with at least 80% overall identity, preferably at least 90% overall identity to the amino acid sequence of Table 4.
10. A nucleotide sequence comprising at least 10, preferably 15 and more preferably 20 consecutive nucleotides of Sequence ID NO:1 or Sequence ID NO:3.
11. A recombinant vector comprising a polynucleotide of any of claims 1 to 10.
12. A host cell comprising the recombinant vector of claim 11.
13. A substantially purified Lyp protein.
14. The protein of claim 13 which is a human Lyp protein.
15. The protein of claim 13 wherein the protein comprises an amino acid sequence selected from
- (a) the amino acid sequence of Table 2 (Sequence ID NO:2); and

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(b) the amino acid sequence of Table 4 (Sequence ID NO:4).

16. A substantially purified protein having an amino acid sequence of greater than 70% overall identity to the amino acid sequence of Table 2.

17. A substantially purified protein having an amino acid sequence of greater than 70% overall identity to the amino acid sequence of Table 4.

18. A substantially purified protein having an amino acid sequence with at least 80% overall identity, preferably at least 90% overall identity, to the amino acid sequence of Table 2.

19. A substantially purified protein having an amino acid sequence with at least 80% overall identity, preferably at least 90% overall identity, to the amino acid sequence of Table 4.

20. A peptide comprising at least 5, preferably 10, more preferably 20 consecutive amino acids of Sequence ID NO:2 or Sequence ID NO:4.

21. A peptide comprising at least one functional domain of a Lyp protein.

22. A peptide comprising at least one antigenic determinant of a Lyp protein.

23. An antibody which binds specifically to a Lyp protein.

24. The antibody of claim 23 which is a monoclonal antibody.

25. The antibody of claim 23 which is a polyclonal antibody.
26. A hybridoma cell that produces the antibody of claim 16.
27. A method for producing a Lyp protein comprising culturing the host cell of claim 12 under conditions in which the Lyp protein is expressed and isolating the Lyp protein therefrom.
28. A method for screening a candidate compound for an ability to increase or decrease the phosphatase activity of a Lyp protein comprising
- (a) providing an assay system for assaying Lyp phosphatase activity;
  - (b) assaying Lyp phosphatase activity in the presence or absence of the candidate compound; and
  - (c) determining whether the Lyp phosphatase activity was higher or lower in the presence of the candidate compound than in its absence.
29. A method for screening a candidate compound for ability to modulate expression of a Lyp gene comprising
- contacting a cell with a candidate compound, wherein the cell includes a regulatory region of a Lyp gene operably joined to a coding region; and
  - detecting a change in expression of the coding region.
30. A non-human animal wherein a genome of said animal, or of an ancestor thereof, has been modified by a modification selected from the group consisting of:
- (a) knockout of a Lyp gene; and
  - (b) insertion of a polynucleotide encoding a heterologous Lyp gene.

31. The animal of claim 30 wherein the polynucleotide encodes the amino acid sequence of Table 2 (Sequence ID NO:2) or Table 4 (Sequence ID NO:4).

32. The animal of claim 31 wherein the polynucleotide comprises the nucleic acid sequence of Table 1 (Sequence ID NO:1) or Table 3 (Sequence ID NO:3).

33. A pharmaceutical composition comprising an active ingredient selected from the group consisting of:

- (a) an isolated nucleotide sequence encoding a Lyp protein;
- (b) a substantially purified Lyp protein;
- (c) a substantially purified antibody which binds specifically to a Lyp protein

and a pharmaceutically acceptable carrier.

34. A method for treating a subject having a deficiency of Lyp activity comprising administering to the subject an effective amount of an agent selected from the group consisting of:

- (a) an isolated nucleotide sequence encoding a Lyp protein;
- (b) a substantially purified Lyp protein.

35. A method for modulating signalling mediated by the T cell receptor, the method comprising administering to a T cell an agent which increases Lyp phosphatase activity or increases Lyp expression in the T cell.

36. A method for reducing or preventing T cell activation and/or proliferation, the method comprising administering to the T cell an agent which increases Lyp phosphatase activity or increases Lyp expression in the T cell.

37. A method for treating a disorder which requires

immunosuppression, the method comprising administering to the subject in need of treatment an immunosuppression-effective amount of an agent which increases Lyp phosphatase activity or increases Lyp expression.

38. A method for treating lymphoma in a subject, the method comprising administering to the subject an agent which increases Lyp phosphatase activity or increases Lyp expression in an amount effective to reduce or prevent lymphoma cell proliferation.

39. A method for preventing or treating a disorder characterised by an abnormality in the T cell receptor signalling pathway or the IL2-mediated signalling pathway, comprising modulating signalling by administration of an agent which increases Lyp phosphatase activity or Lyp expression.